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SUBJECT: SUBMITTAL OF RECOMMENDED COURSE OF ACTION FOR S1W LEACHING BEDS CAPACITY

Reference: (a) Phase I Remedial Design Report/Remedial Action Work Plan, September 1999
(b) Final Record of Decision, Naval Reactors Facility, September 1998

This letter forwards a recommended course of action to address soil capacity issues at the S1W Leaching Beds, which is a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site at the Naval Reactors Facility (NRF).

The S1W Leaching Beds (NRF-14) are currently being used for consolidation of contaminated soil excavated from various CERCLA sites at NRF. The Phase I Remedial Design/Remedial Action (RD/RA) Work Plan, reference (a), provided a general approach for consolidating the soil. This approach included placing the soil in soft-sided containers (SSCs) and double stacking the SSCs in the S1W Leaching Beds, anticipating the area would be covered with an engineered cover as part of the Phase II Remedial Actions.

While the total amount of site contamination to be remediated has not increased, more soil than originally estimated has been removed to ensure CERCLA cleanup levels are met. A re-evaluation of the estimated amount of soil to be excavated at the remaining CERCLA sites was completed based on actual work experience. Table 1 of the attachment provides new, conservative soil volume estimates associated with future excavations. Based on these new estimates, additional capacity is needed at the leaching beds to accommodate the higher volume of soil.

The attachment provides the rationale for the recommended course of action. Figure 1 shows the proposed placement of SSCs in and around the S1W Leaching Beds and S1W Leaching Pit (NRF-12B). This option would provide sufficient space for the remaining soil to be excavated without the additional expense of off-site disposal. The footprint of contaminated soil would not be increased, although the engineered cover would be slightly enlarged.

Since the final design of the engineered cover will not significantly change, this proposed action does not jeopardize the proposed remedy under the Phase I RD/RA Work Plan. Thus, an Explanation of Significant Difference to the NRF Final Record of Decision, reference (b), is not considered necessary. However, the Work Plan indicates that concurrence from the Agencies will be obtained prior to implementing consolidation actions that differ from the Work Plan.

Please call William S. Knoll of my staff at 208-533-5066 if you have any questions or require additional information.

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Attachment:
AS stated

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Attachment to
NR:IBO-01/034
May 14, 2002

S1W Leaching Beds Capacity Issues

Background

Contaminated soil above cleanup levels established in the NRF Comprehensive Record of Decision (ROD) is permanently placed into the S1W Leaching Beds (NRF-14), as part of the remedial actions for several sites at NRF. Soft-sided containers (SSCs) are used to transport and place the soil into the beds. After the SSCs are placed into the beds, an engineered cover is to be constructed over the beds and the adjacent S1W Leaching Pit area (NRF-12B).

The Phase I Remedial Design/Remedial Action (RD/RA) Work Plan showed double stacking the SSCs in the S1W Leaching Beds. Originally, it was expected that double stacking SSCs within the leaching beds would not exceed the surface level of the beds. During the accomplishment of Phase I Remedial Actions, more soil than originally estimated has been removed to ensure all potentially contaminated soil is remediated. Additionally, after placing a single layer within the south leaching bed it has become apparent that double stacking will place a large portion of the second layer of SSCs above the surface level of the berm surrounding the beds. This operational experience required a review of options available to accommodate the expected increased volume of soil for all Phase I remedial actions. The option recommended below is consistent with the contingency options given in the NRF Comprehensive ROD, which included off-site disposal of soil and continued consolidation at NRF-14 (S1W Leaching Beds) above surface level. The recommended option would locate all soil within the S1W Leaching Beds contamination zone and the engineered cover would require essentially the same footprint identified in the Work Plan. However, the profile of the cover will be above the existing surface level. The Work Plan states that any consolidation of soil at the leaching beds above surface level requires consultation and approval from the Agencies.

Discussion

As of January 10, 2001, approximately 1140 cubic yards of contaminated soil have been excavated during remedial actions. This is more than anticipated for the actions completed. Approximately 310 cubic yards of contaminated soil were encountered at the A1W Leaching Bed (NRF-19) during excavation of the discharge pipe. No contaminated soil was expected at this site. Approximately 830 cubic yards of contaminated soil have been excavated at NRF-21A. Originally, 385 cubic yards of contaminated soil were estimated for the entire NRF-21A remedial action. Contamination has been found along the pipe, which was not anticipated, and a large portion of the 830 cubic yards excavated to date is from along the pipe. Estimates for the overall amount of site contamination has not changed.

The Phase I RD/RA Work Plan showed the SSCs being double stacked in the S1W Leaching Beds with a total capacity of 230 SSCs, which was enough capacity for the expected amount of soil. A revised estimate was needed for the amount of contaminated soil expected and, therefore, the estimated number of SSCs needed to complete the remedial actions.

A further consideration was the newly established reduced loading height (43 inches versus 60 inches) of each SSC. The new height reduces the volume placed into each SSC by about 25 to 30%, and reduces the height profile of the SSCs when placed in the leaching beds.

Soil Volume Estimates

Revised estimates of the amount of soil expected for the OU 8-08 remedial actions were developed to help scope out the design of the covers and to determine if the existing capacity at the S1W Leaching Beds is sufficient for the remaining contaminated soil. The new estimates are considered conservative and are based on past sampling and in-the-field excavation work at completed, or in process, CERCLA sites. The revised volume of soil generated to date and the new estimates are more than previously anticipated. The reason for this includes past remedial investigation sampling

not detecting contamination in some excavation areas (such as NRF-19, A1W Leaching Bed). In addition, it is not possible to identify soils with radionuclide levels near cleanup levels without detailed, time-consuming sampling, since field instrumentation is not sensitive enough to distinguish from background radioactivity. A more practical application of resources is being applied to excavate a greater volume of soil in suspect areas to ensure all potentially contaminated soil is remediated and to maintain a timely remediation pace.

Table 1 provides the actual volume of contaminated soil encountered (i.e., soil treated as suspect and bagged for consolidation), previous estimates used in the feasibility study, and revised estimated totals based on in-the-field experience and additional conservatism. In addition, the number of SSCs expected to be filled is given. The number of SSCs is helpful since a computerized map will show the placement of the SSCs at the leaching bed area and more accurately reflect the volume of soil that can be placed in the area.

Recommendation

Because of the anticipated additional number of SSCs, the actions required to handle the additional SSCs must be addressed. The recommended action, shown on Figure 1, includes placing SSCs outside the leaching beds, but within the existing contamination zone. The area outside the beds would need to be grubbed (vegetation removed) and prepared for the SSCs. In addition, a foot or two of surface soil could be removed in the locations outside the beds where the SSCs are to be placed. This soil could be placed around the SSCs in the leaching beds where void spaces currently exist. The removal of this soil would serve several purposes, as follows:

- Although this soil is generally expected to be clean, soil with small amounts of windblown particles from the beds would be removed in these areas.
- Provide easy access to soil needed to cover the SSCs within the leaching beds while reducing the amount of clean soil being trucked in from other sources.
- Provide a cleaner work area for construction of the cover, which simplifies radiological controls.
- Reduce the height profile (in areas adjacent to the beds), and therefore the size (due to slope requirements) and cost of the engineered cover.
- This action would be consistent with the RD/RA Scope of Work for OU 8-08 (December 1998), which states that the grading work needed prior to cover construction may include scraping a few feet of soil from around the S1W Leaching Beds and S1W Leaching Pit, to contain sporadic contamination from windblown deposits, and that this soil would be used to fill in the leaching beds.

The Work Plan states that a 6-12 inch layer of soil would be placed between the two levels of SSCs. After discussions with the current subcontractor personnel who have experience with road construction and landfill operations, a soil layer of at least 18 inches is needed to provide the proper stability for heavy equipment to transport and place the SSCs for the second level. The reduced loading height of the SSCs will counteract the increased height due to this soil layer.

A double layer of SSCs would be placed within and adjacent to the leaching beds. The double layer of SSCs would be placed in strategic locations within the S1W Leaching Beds. Since the leaching beds have tapered sides, it is estimated that another row of SSCs can be placed around the perimeter when the second layer of SSCs is placed in the leaching beds. This would allow the second layer to have significantly more capacity in the leaching bed area than the first layer at the bottom of the beds. For example, in the south leaching bed the first layer contains 92 SSCs, but the second layer (including the additional row of SSCs around the perimeter) would potentially contain 139 SSCs. Portions of the north bed will contain only a single layer, to prevent encroachment of the engineered cover on the NRF parking lot and perimeter road.

The area outside the leaching beds where SSCs could be placed would be encompassed by the proposed engineered cover over the leaching beds (NRF-14) and leaching pit (NRF-12B), and would be within the currently fenced area. The cover would encompass these areas for several reasons: (1) ease of cover design, construction, and placement; (2) necessity to encompass the contaminated zone below the surface in proximity to NRF-12B and NRF-14; and (3) requirement to cover isolated contaminated near-surface areas between NRF-12B and NRF-14. In addition, the areas outside the leaching beds have natural depressions (between the leaching beds and the leaching pit and to the southeast of the leaching beds), which lend themselves for the placement of SSCs. There is some uncertainty concerning the size of the leaching pit toward the southern end of the site, and whether it extended to the fence line surrounding the area. Past analytical data given in the NRF Comprehensive Remedial Investigation/Feasibility Study indicates the contamination below the surface could extend to the southeast fence line. Also, a topographical map shows a slightly raised area that extends from the asphalt cover at NRF-12B to the fence line, which would indicate the possible location of the extended portion of the pit that was later filled in.

Conclusion

The recommended action is shown in Figure 1 (with a cross-section view shown in Figure 2). This would have a minimal affect on the design of the proposed cover. SSCs on the second layer would be strategically placed such that the perimeter dirt road would not be impacted.

The recommended action should accommodate the volume of contaminated soil expected from the remedial actions, preventing the need to ship soil off-site. Approximately 983 SSCs could be accommodated using this option, which provides a small margin over the new conservative soil volume estimates. The cover would have to be slightly larger in the southeast direction to attain the proper slope requirements, due to the higher cover elevation associated with a second layer of SSCs. Although the cover would be slightly larger than originally envisioned, the footprint of contaminated soil would not increase since the SSCs would be placed in areas with near-surface and subsurface contamination.

The option given in the Phase I RD/RA Work Plan showed a double layer only within the leaching beds. As can be seen from Figure 3, the original proposal identified in the Work Plan, the currently estimated soil from the remaining CERCLA remedial actions could not be accommodated within the original capacity. Absent an amended on-site soil plan, excess soil would have to be sent off-site for disposal at a proposed soil repository at the Idaho Nuclear Technology and Engineering Center (INTEC), the Radioactive Waste Management Complex (RWMC), or an off-INEEL facility such as Envirocare in Utah. In addition, shipment of SSCs off-site would require more sampling of the soil (for characterization purposes), would tend to retard the excavation work, and would incur additional costs for sampling, packaging, transportation, and disposal. The Feasibility Study estimated off-site disposal of soil at $400 per cubic yard. Figure 3 shows that an estimated total of 419 SSCs could be placed in double layers within the leaching beds. This would require up to 472 SSCs (3500 cubic yards; $1.4M) to be sent off-site if the higher soil volume estimates from Table 1 are encountered.

Finally, although the option proposed in this submittal is expected to handle the maximum estimated soil to be excavated during remedial actions, this option would not preclude expanding the consolidation area for the soil in the southeast direction (with a correspondingly expanded cover design), or sending excess soil off-site for disposal, if significantly more soil is encountered than expected in the future. These would remain as contingency actions if needed, and would be the subject of an additional NRF/IBO proposal to EPA and IDEQ.

Table 1 – Soil Volume Estimates						
Site	Actual Soil Volume Excavated (ft^3)	Actual SSCs Filled	Previous Soil Volume Estimate (ft^3) – considered low estimate	Estimated[(a)] SSCs (low)	Revised Soil Volume Estimate (ft^3) – considered high estimate	Estimated SSCs (high)
NRF-14	0	0	0	NA	NA	NA
NRF-19	8,370	31	0	NA	NA	NA
NRF-80	140	0.5	0	NA	NA	NA
NRF-21A (to date, 11/17/00)	22,305	100.5	See Below	NA	NA	NA
NRF-21A, pipe (remaining)	-	-	10,530	53[(b)]	10,530	53
NRF-21A, basin (remaining)	-	-	10,370	52	19,200	96
NRF-11, drainfield	-	-	840	5	7,520	38
NRF-11, L-shaped sump	-	-	1,100	6	2,650	14
NRF-21B	-	-	1,250	7	2,500	13
NRF-17	-	-	2,520	13	29,400	147
NRF-12A, pipe from ret. Basins to manhole	-	-	8,730	44	46,500	233
NRF-12A, pipe from manhole to pit	-	-	33,000	165	33,000	165
Totals	30,815	132	68,340	345+132= 477[(c)]	151,300	759+132= 891[(c)]

(a) The estimate low for the SSCs was the original soil volume estimate except for NRF-21A where in-the-field observations show contamination along the pipe that was not originally expected.

(b) Previous soil estimates did not include contamination along the pipe and was not shown in the Phase I Remedial Design Report/Remedial Action Work Plan. The low estimate takes into account the amount of contaminated soil found adjacent to the pipe during current excavation. Since this is based on in-the-field observations the low and high estimates are the same.

(c) Number takes into account actual number of SSCs filled.

The new loading height of SSCs is 43 inches, which corresponds to a volume of approximately 200 cubic feet.

Table is current as of 1/10/01.

Figures

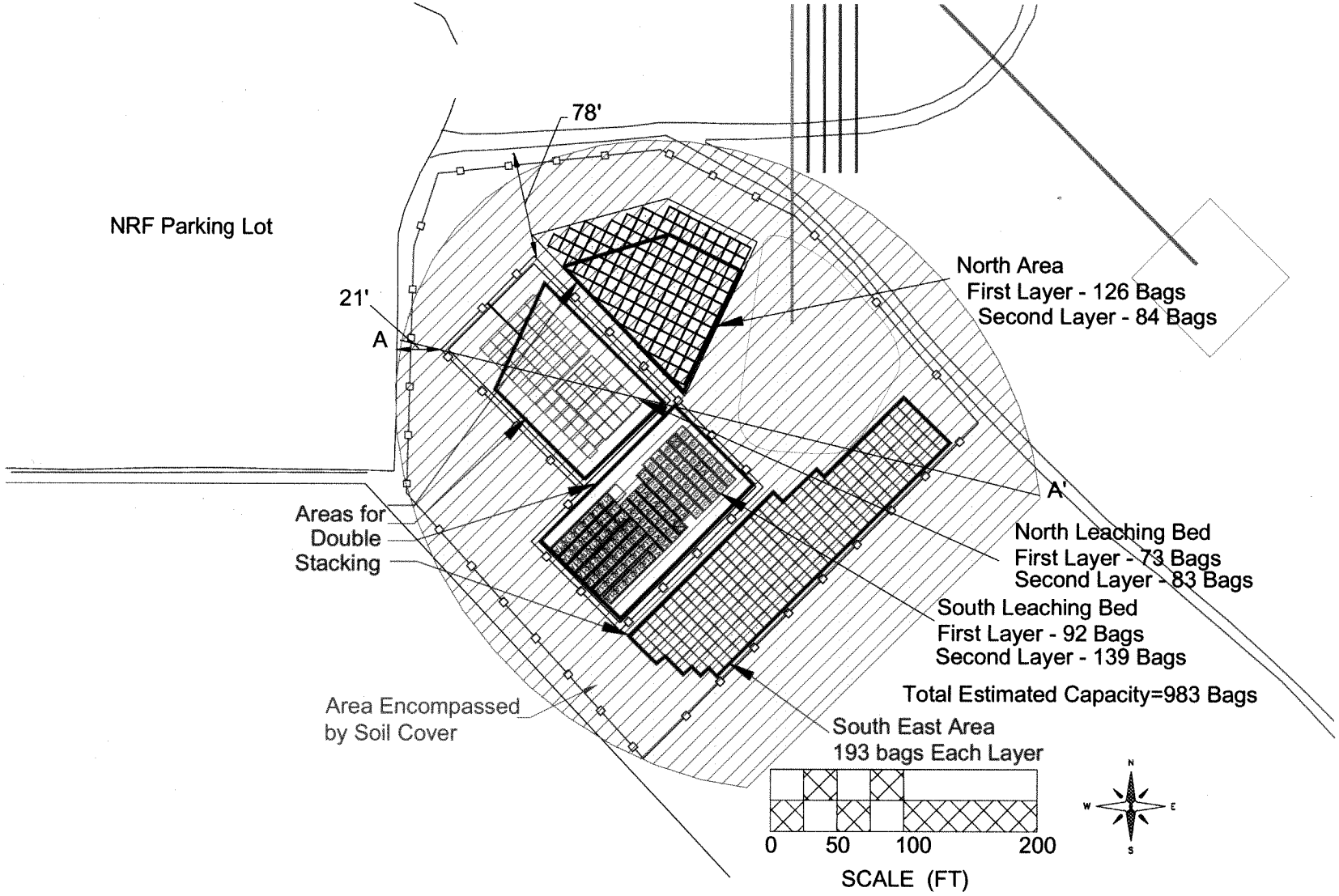
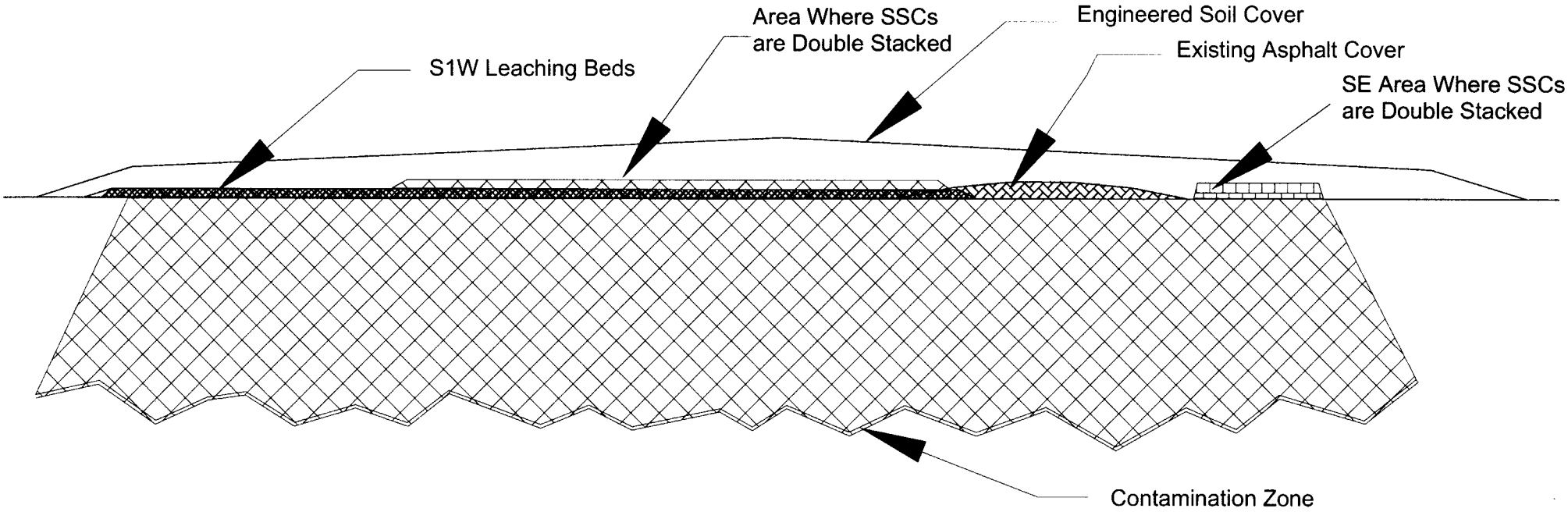


Figure 1 Recommended Placement of SSCs



Cross Section A-A'

Figure 2 Cross-section from Figure 1

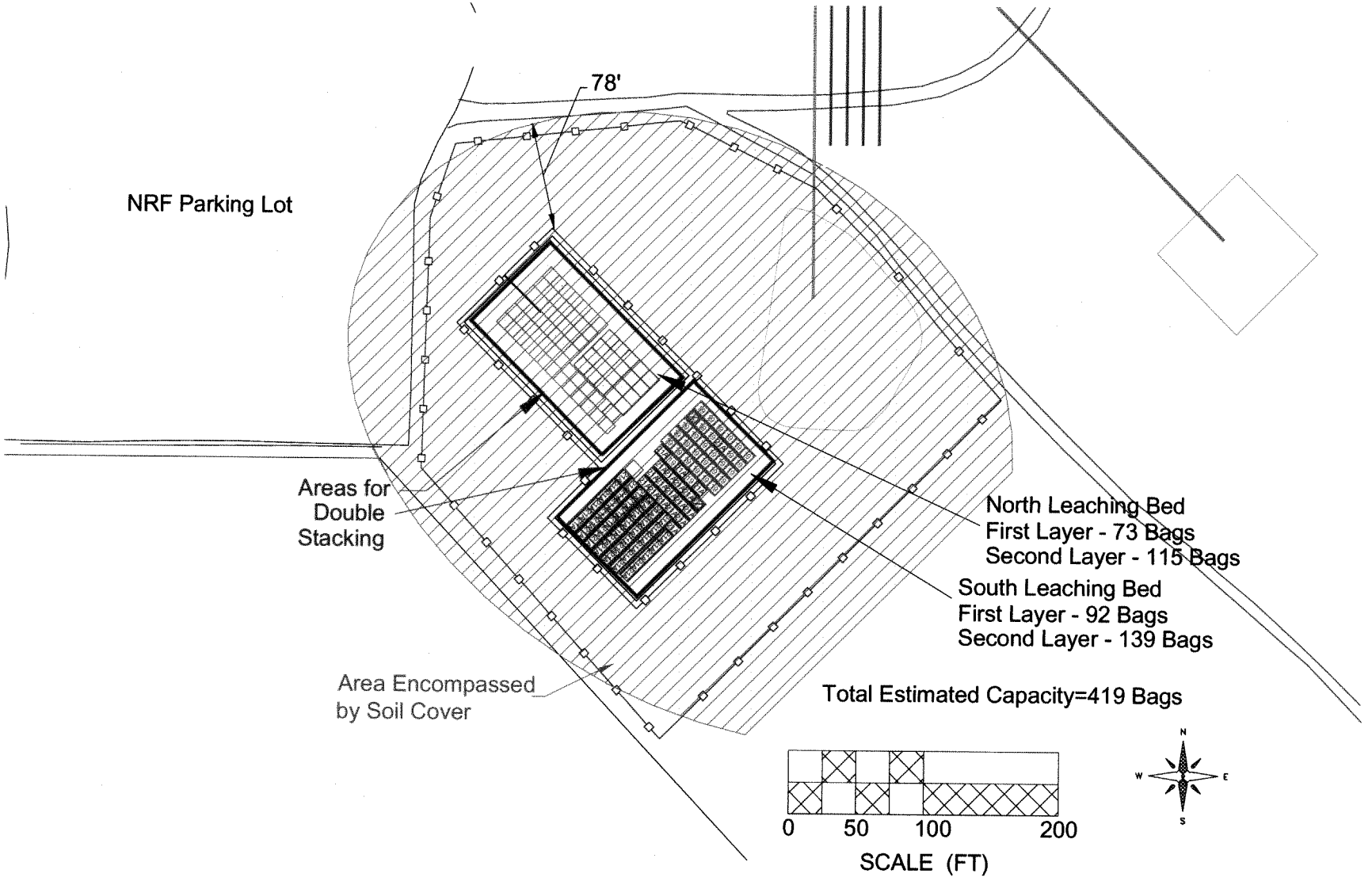


Figure 3 Original Proposal for SSC Placement given in the Phase I RD/RA Work Plan